REMARKS

Applicant respectfully traverses all art rejections in the Office action of 12/27/2005.

I. Rejection of claims 1-3 and 5-30 as being anticipated by Nelson et al., USPN 6947057.

Examiner has rejected all pending claims as being anticipated by Nelson et al, hereinafter referred to as Nelson. Claim 1 is reproduced for purposes of discussion:

> 1. A method for generating antialiased lines, comprising the actions of:
>
> for each respective line, determining which of a plurality of orientation classes that entire line falls into; and
>
> performing subpixel sampling using one of a plurality of multi-point sampling patterns, in dependence on which of said plurality of orientation classes that line falls into.

In rejecting claim 1, Examiner cites Nelson as teaching the claimed limitation of, "performing subpixel sampling using one of a plurality of multi-point sampling patterns, in dependence on which of said plurality of orientation classes that line falls into," by referring to Nelson at col. 28-29, lines 64-12, which states:

> Rendering unit 150A may compute a slope and intercept for each side of the line bounding box based on (a) the bounding box width d_{BB}, and (b) the slope m and intercept b of the line segment 2106. For an X-Major line segment, rendering unit 150A may determine the upper and lower box edges by the equations

> y=mx+(b+V)
> and
> y=mx+(b-V)
> respectively, where $V=(\frac{1}{2})d_{BB}$ *secant(θ), and where θ is the angle that the line segment forms with respect to the positive x axis. It is noted that the value secant(θ) may be stored in a lookup table addressed by slope m.

Applicants respectfully submit that this passage only teaches how to compute a slope and intercept for bounding boxes used in Nelson, and does not refer to selection of sampling patterns.

Specifically, Applicant respectfully submits that the above-referenced passage does not teach or suggest the claimed limitation of, "performing subpixel sampling using one of a plurality of multi-point sampling patterns, in dependence on which of said plurality of orientation classes that line falls into." If Applicant has overlooked a relevant teaching, it is respectfully requested that such teaching be pointed out with particularity.

To support Examiner's position, Examiner states in the office action, at page. 3, the following:

> Note, the Office interprets that the number and positioning of each perturbed sample is based upon the classification of the line, X or Y-major, since the number and positioning of the samples is directly based upon the bounding box made around the line segment, this bounding box, specifically its upper and lower edges, further computed by the m and b components of the line segment (see columns 28-29, lines 64-12).

Applicant respectfully disagrees with several points in Examiner's statement. For example, Examiner states that the number and position of the samples are based on the classification of the line as X- or Y- major. However, Applicant finds no such teaching in Nelson. To the contrary, Nelson

specifically teaches (in the descriptions of Figures 8-10 generally) that the sample patterns, whether perturbed or stochastic, are preferably generated at random. To wit:

> In the perturbed regular positioning scheme 192, sample positions are defined in terms of perturbations from a set of fixed positions on a regular grid or tiling. In one embodiment, the samples may be displaced from their corresponding fixed grid positions by random x and y offsets, or by random angles (ranging from 0 to 360 degrees) and random radii (ranging from zero to a maximum radius). [Col. 21, lines 4-10, emphasis added.]

> Stochastic sample positioning scheme 194 represents a third potential type of scheme for positioning samples. Stochastic sample positioning involves randomly distributing the samples across the 2-D viewport. Random positioning of samples may be accomplished through a number of different methods, e.g., using a random number generator such as an internal clock to generate pseudo-random numbers. Random numbers or positions may also be pre-calculated and stored in memory. [Col. 21, lines 19-27, emphasis added.]

> Turning now to FIG. 9, details of one embodiment of perturbed regular positioning scheme 192 are shown. In this embodiment, samples are randomly offset from a regular square grid by x- and y-offsets. [Col. 21, lines 28-31, emphasis added.]

These passages teach away from the claimed limitations in at least claim 1, as argued above. Specifically, these (and other) passages in Nelson teach that, though there are several types of sampling patterns (*i.e.*, regular positioning scheme, perturbed, or stochastic), none depend on an orientation class for the line being antialiased.

Applicant finds no teaching in Nelson that the sample pattern is "based on the classification of the line, X or Y-Major," as Examiner asserts. In

support of this statement, Examiner provides only the citation to columns 28 and 29, lines 64-12, which are reproduced above and which do not appear to teach or suggest that sample patterns are in any way based on line classification or orientation, as Examiner suggests. If Applicant has overlooked a relevant teaching, it is respectfully requested that such teaching be pointed out with particularity.

Examiner also states that, "the number and positioning of the samples is directly based upon the bounding box made around the line segment." Again, Applicant finds no such teaching in Nelson, neither at Examiner's cited passages nor elsewhere.

Thus, Applicant respectfully submits that the limitations of independent claim 1 is neither taught nor suggested by the cited reference. Further, independent claims 5, 13, 19, 22, and 28 are rejected under the same reference and rationale. The rejections to these claims are therefore believed addressed fully by the arguments made above in favor of claim 1.

Applicant also respectfully submits that the other independent claims of the present application are separately distinguishable from the cited reference. For example, claim 5 states:

> 5. A method for antialiased rendering, comprising the actions of:
> (a) identifying, for at least one respective entire line, which one of a limited number of directions is most nearly parallel to said line; and
> (b) performing subpixel sampling on said line with a subpixel multi-point sampling pattern which has maximal resolution approximately normal to said one direction.

In supporting the rejection of claim 5 (as well as claims 19 and 28), Examiner states:

> ...the Office interprets Nelson et al. to inherently calculate in which direction the line is most nearly parallel to when Nelson et al. discloses computing the slope (m component of the line segment equation) of the line. Also, since the samples used are found within the bounding box which is oriented in the same direction as the line segment, the Office interprets that these samples inherently provide maximal resolution approximately normal to the orientation of the line.

Applicant respectfully submits that, although Nelson teaches how to compute the slope of a line, this does not anticipate the claimed limitation of, "identifying...which one of a limited number of directions is most nearly parallel to said line," as shown in claim 5. Examiner has not cited teaching that "identifies" any "directions...most nearly parallel to said line." For example, the "limited number of directions" could be chosen from horizontal and vertical directions, and, depending on the orientation or slope of the line, either horizontal or vertical could be chosen, as taught in the present application. However, Nelson does not appear to go this far. Merely identifying the slope of the line does not teach or suggest the claimed step of "identifying" a direction to which that line is most nearly parallel.

Further, Examiner has not cited teaching in Nelson which anticipates the claimed limitation of, "performing subpixel sampling on said line with a subpixel multi-point sampling pattern which has maximal resolution approximately normal to said one direction," as claimed in at least claim 5. If Applicant has overlooked a relevant teaching, it is respectfully requested that such teaching be pointed out with particularity.

Applicant respectfully submits that the examiner has misapplied the concept of "inherent" anticipation. Section 102 of Title 35 deals with novelty and loss of patent rights. An invention is said to be "anticipated" when it is

squarely described or disclosed in a single reference as identified from one of the categories of 35 U.S.C. § 102, commonly referred to as "prior art". Express anticipation occurs when the invention is expressly disclosed in the prior art, patent or publication. In some cases, however, when the claimed invention is not described *in haec verba*, the "doctrine of inherency" is relied on to establish anticipation. Under the principles of inherency, a claim is anticipated if a structure in the prior art necessarily functions in accordance with the limitations of a process or method claim. *In re King*, 801 F.2d 1324, 231 U.S.P.Q. 136 (Fed. Cir. 1986). A prior art reference that discloses all of a patent's claim limitations anticipates that claim even though the reference does not expressly disclose the "inventive concept" or desirable property the patentee discovered. *Verdgaal Brothers, Inc. v. Union Oil Company of California*, 814 F.2d 628, 2 U.S.P.Q.2d 1051, (Fed. Cir. 1987). It suffices that the prior art process inherently possessed at that property. *Id.* Mere possibilities or even probabilities, however, are not enough to establish inherency. The missing claimed characteristics must be a "natural result" flowing from what is disclosed. *Continental Can Co. v. Monsant Co.*, 948 F.2d 1264, 20 U.S.P.Q.2d 1746 (Fed. Cir. 1991). Unstated elements in a reference are inherent when they exist as a "matter of scientific fact". *Constant v. Advanced Micro-Devices, Inc.*, 848 F.2d 1560, 7 U.S.P.Q.2d 1057 (Fed. Cir.), *cert. denied*, 488 U.S. 892 (1988) and *Hughes Aircraft Co. v. United States*, 8 U.S.P.Q.2d 1580 (Ct. Cl. 1988). Otherwise, the invention is not inherently anticipated.

Therefore, Applicant respectfully submits that all independent claims in the pending application are distinguished from the cited reference. Favorable reconsideration is respectfully requested.

Because of their dependence on allowable independent claims, all dependent claims are also believed allowable. Favorable reconsideration of all claims is therefore respectfully requested.

Further, several dependent claims are believed allowable on their own merit. For example, dependent claim 3 states:

> 3. The method of claim 1, wherein said orientation classes correspond one-to-one to said sampling patterns.

In rejecting claim 3, Examiner states at page 4 of the Office action:

> The Office interprets that the determination of X or Y-Major line corresponds one-to-one to the number and positioning of the samples found within the bounding box since the bounding box has a correspondence with the line segment in Nelson et al.

Examiner provides no citation to Nelson in support of this statement. Applicant respectfully submits that the bounding boxes are not the samples. For example, Nelson describes sample points at col. 3, lines 19-22:

> As used herein, the term "sample" refers to calculated color information that indicates the color, depth (z), and potentially other information, of a particular point on an object or image.

However, the "bounding box" described in Nelson is used to determine candidate bins:

> In step 217, rendering unit 150A may determine a subset of spatial bins which, based on their positional relation to the given triangle, may contribute samples that fall within the given triangle. The bins in this subset are referred to herein as candidate bins. In one embodiment,

rendering unit 150A may determine the candidate bins by computing a minimal bin bounding box, i.e. a minimal rectangle of bins which efficiently contains the triangle bounding box, as suggested in FIG. 13C. For example, rendering unit 150A may first compute coordinates for a triangle bounding box by determining the maximum and minimum of the x and y coordinates of the triangle vertices. By rounding up and down the triangle bounding box coordinates, rendering unit 150 may determine coordinates for the minimal bin bounding box. In another embodiment, rendering unit 150A may use triangle vertex data to determine a more efficient (i.e. smaller) subset of candidate bins as shown in FIG. 13D. Rendering unit 150A may eliminate bins in the minimal bin bounding box which have no intersection with the triangle.

Therefore, Applicant respectfully submits that the Examiner has not made out a *prima facie* case against at least dependent claim 3.

Conclusion

Thus, all grounds of rejection and/or objection are traversed or accommodated, and favorable reconsideration and allowance are respectfully requested. The Examiner is requested to telephone the undersigned attorney or Robert Groover for an interview to resolve any remaining issues.

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Respectfully submitted,

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